



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ing the valuable gems are given in detail. The greater part of the work is devoted to the detailed descriptions of the individual types of stones. In the third part of the work is given a systematic method of examining a stone, with a key for use in the determination. A chapter is devoted to the means of identifying the various imitations in use in the trade. A list of 250 trade names of gems, with the scientific name of the mineral and the group in which it belongs in parallel columns, will prove of great value for reference.—W. H. HOBBS.

PETROGRAPHY.¹

Rock Differentiation.—Harker² contributes an interesting article on rock differentiation in his study of the gabbro of Carrock Fell, England. The hill in question consists of bedded basic lavas, gabbro, granophyre and diabase in the order of their intrusion. The gabbro is of especial interest, since it presents a simple example of rock differentiation. In its center the mass is quartziferous. Toward the periphery it passes gradually into an ordinary gabbro, and immediately upon the border into an aggregate composed largely of titaniferous magnetite. In explaining the causes of this gradual transition in chemical and mineral composition, the author discards the theories usually proposed to explain similar phenomena, and concludes that, in the case under discussion, the separation of the magma into its parts took place during the period of crystallization by concentration of the crystallizing substances. The concentration is greatest for those minerals belonging to the earliest stages of the rock's history, hence it is thought that the differentiation took place by diffusion in a fluid magma, and that in those parts of this magma richest in basic minerals crystallization first occurred. As the crystals separated, the supply of the crystallizing substance was kept up by diffusion from other portions of the magma into the basic portions.

Another interesting feature of the gabbro mass relates to the contact effects produced by the rock in the surrounding basic lavas, some of which are enclosed as fragments in the midst of the gabbro. Their isotropic base has crystallized, and some changes have been produced

¹ Edited by Dr. W. S. Bayley, Colby University, Waterville, Maine.

² Quart. Journal Geol. Soc., 1894, p. 311.

in the composition and structure of their phenocrysts. At the immediate contacts of the different rocks a commingling of their materials seems to have taken place. Mica has been generated in the gabbro, and the groundmass of the lavas has disappeared, leaving a plexus of small feldspar laths imbedded in a clear mosaic of quartz or of quartz and feldspar.

The Metamorphism of Inclusions in Volcanic Rocks.—

In a memoir presented to the French Academy of Sciences, Lacroix³ gives a very full resumé of the conclusions reached by him in the study of the action of modern volcanic rocks on the inclusions imbedded in them. The conclusions are based on the results of late studies as well as on those reached several years ago.⁴ The author finds that the basaltic and the feldspathic effusives act differently toward foreign fragments imbedded in them. The former act principally through their high temperature, fusing the most easily melted components of the inclusions, while the trachytic rocks act more effectively in producing mineralogical changes through the aid of the mineralizers, mainly water, with which they are abundantly provided. The physical and chemical changes suffered by the material of the inclusions are discussed separately and fully. Often the fragments in the basalts are reduced by fusion to a few grains of their most resistant components, while the fragments in the trachytes have lost only their micaceous constituents by fusion. Consequently the metamorphism in the latter cases is supposed to have been produced at a comparatively low temperature, although the new minerals produced in number exceed by far those produced in the basaltic inclusions at a much higher temperature. With respect to the effects produced on rocks in situ, it is found that basaltic and trachytic lavas act alike—mainly through their heat. The metamorphic action in both cases is comparatively slight. The similarity in the effects produced by the two types of lavas in this case, when compared with the dissimilar effects produced upon their inclusions, is explained as a consequence of the fact that all lavas, when they reach the surface, lose their volatile constituents, and so, of necessity, can affect alteration in contiguous rock masses solely by means of their high temperature. In other words, the alteration of inclusions is effected at a depth beneath the surface, while the alteration of rocks in situ is a surface phenomenon.

³ Mémoires présentés à l'Acad. d. Sciences de l'Institut de France, xxxi.

⁴ See American Naturalist, 1894, p. 946.

The Petrography of Aegina and Methana.—The lavas of the island of Aegina and the peninsula Methana in Greece are andesites and dacites that have broken through cretaceous and tertiary limestones. Washington⁵ separates the rocks into the two groups above-mentioned on the basis of the SiO_2 contents. Rocks containing above 62% of SiO_2 he classes as dacites, those containing less than this amount as andesites. The dacites are divided into hornblende, hornblende-hypersthene and biotite varieties, and the andesites into hornblende, biotite-hornblende, hornblende-augite, hypersthene and hornblende-hypersthene varieties. All the rocks are more or less porphyritic, and all contain more or less glass. Tridymite is present in the hornblende andesites from the Stavro district. The trachyte described by Lepsius from near Poros is a biotite-hornblende-andesite. Brown and green hornblendes are both present in the Grecian rocks, but not in the same specimens. The green variety is characteristic of the pyroxene free andesites, and the brown variety of those rocks containing an almost colorless pyroxene as one of its essential components. This association of the two hornblendes indicates that their formation is dependent upon differences in chemical composition of the magmas from which they separated, as well as upon the conditions under which their separation took place.

In almost all of these rocks there are segregations of the same composition as that of the enclosing rocks, except that they are more basic. Two classes of segregations are observed. The first are hornblende-augite-andesites, containing brown hornblende and no glass; the second class is composed of green hornblende in a glassy base with plagioclase laths. The brown hornblendes are often changed to opacite, surrounded by a zone of colorless crystals of augite. In those segregations in which the hornblende is of the green variety, no such alteration is observable. The glass in these segregations is so different from that of the rock in which they occur, that it cannot be regarded as portions of the latter. The author is inclined to regard these bodies as fragments of earlier lava flows buried deeply beneath the latter ones.

In his discussion on the general relations of the different rocks of the region, the author states that "in general * * * the more acid the rock the more vitreous the groundmass, the smaller and more micro-litic the crystals in it, and the larger and more abundant the phenocrysts."

After remarks on the chemical relations of the different rock types to each other, and a discussion of the Aegina-Nisyros region as a

⁵ Jour. of Geology, Vol. II, p. 789, and Vol. III, p. 21.

"petrographical province," the paper closes with the statement that although the lavas of the region under discussion are so similar to those of the Andes, nevertheless, the original undifferentiated magmas of the two districts were quite dissimilar.

Maryland Granites.—The granite and associated rocks on the east side of the Susquehanna River in Cecil County, Maryland, have been made the subject of study by Grimsley.⁶ In the northern portion of the area investigated, the granite is but little sheared, while in its southern portion the rock is very gneissic. The two portions of the area are separated from each other by a band of staurolite-schist. Though the rocks of both areas were originally the same in composition, it is thought that the northern granite may be the younger, since it is intruded by dykes of what appears to be a dynamically metamorphosed gabbro, while, on the other hand, the southern granite intrudes a basic rock that apparently grades into gabbro. Both granites are biotitic varieties, and both are eruptive in origin. The northern granite is remarkable for the epidotization of its feldspar, which is predominantly plagioclastic, and for the occurrence in it of numerous dark basic segregations. Many rare minerals, such as zircon, magnetite, tourmaline, cubical garnets and sphene were found in large quantities in the soil produced by its decomposition. The northern contact of the northern granite is somewhat abnormal in its characters. The granite appears to become more basic toward the contact, and the basic phases are cut by apophyses of the normal acid rock.

An analyses of the granite follows:

SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	Feo	MnO	CaO	SrO	BaO	MgO	Na ₂ O	Li ₂ O	H ₂ O	P ₂ O ₅	Total
66.68	.50	14.93	1.58	3.23	.10	4.89	tr.	.08	2.19	2.65	tr.	1.25	.10	= 100.32

Alabama Cherts.—Hovey⁷ has recently examined a series of cherts sent him from Alabama. Those from the Lower Magnesian series consist almost entirely of chalcedony, with the addition of a little quartz and opal. The rocks are fine-grained mosaics that are mottled by reason of variations in the fineness of their grains. The quartz appears to be secondary, as it fills cavities in the chalcedony. A few scales of limonites and dust particles are present in almost all sections. No well-defined organic remains were detected in any. The cherts from the Lower Carboniferous, on the other hand, contain numerous

⁶ Jour. Cin. Soc. Nat. Hist., Apr.–July, 1894.

⁷ Amer. Jour. Sci., 1894, xlviii, p. 401.

remains of calcareous organisms, which are cemented together by chalcedony exhibiting a tendency to form concretionary granules. In some specimens, genuine spherocrystals of this mineral were detected. Chemical analysis of both classes of cherts show the absence of opal. The author regards the rocks as chemical precipitates.

GEOLOGY AND PALEONTOLOGY.

The Californian Coast.—A. G. Lawson presents the following as the sequence of events which have led to the present topography of the Coast of California north of the Golden Gate:

I. A development in Pliocene time of a great coastal peneplain with correlative accumulation of marine sediments.

II. The orogenic deformation of parts of this peneplain and folding of the Pliocene strata.

III. The reduction of the soft upturned Pliocene strata to base level.

IV. The progressive uplift of this peneplain to an elevation of from 1600 to 2100 feet above sea land, the adjacent mountainous tracts participating in the same movement.

V. The advance in the new geomorphic cycle to a stage of early maturity.

VI. A very recent depression of about 100 miles of the coast adjacent to the Golden Gate, and the consequent flooding of the stream valleys by the ocean.

This history is in harmony with the disastrous record of the coast south of the Golden Gate presented by Mr. Lawson in a former paper. (*Bull. Univ., Cal., Vol. I., 1894*).

Disintegration of Granite.—Of the agencies concerned in the disintegration of the granite rocks in the District of Columbia, U. S., Mr. G. P. Merrill considers hydration the most pronounced and universal in its effects. During an examination of material from the region under discussion, both granite and dioritic rocks with smooth even faces taken from depths of a hundred feet or more were examined, and many, which under casual inspection showed no signs of decomposition, were found to disintegrate rapidly into coarse sand after a short exposure to the atmosphere. The author's explanation of this behavior is that the minerals composing the rocks (with the exception